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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2921
Plant ID No.:	049-00145
Applicant:	Consol Energy, Inc. (Consol)
Facility Name:	Northern West Virginia Water Treatment Plant
Location:	Marion County
NAICS Code:	221300
Application Type:	Construction
Received Date:	February 22, 2012
Engineer Assigned:	Joe Kessler
Fee Amount:	$2000
Date Received:	February 23, 2012 ($500)
	March 29, 2012 ($1,500)
1st Complete Date:	March 29, 2012
On-Hold Date:	April 19, 2012
2nd Complete Date:	June 14, 2012
Due Date:	August 22, 2012
Applicant Ad Date:	February 27, 2012
Newspaper:	*Times West Virginian*
UTM's:	Easting: 551.9 km Northing: 4,377.4 km Zone: 17
Description:	Construction of a mine-water treatment plant.

In March 2011, as part of a consent decree agreement with the USEPA, the Department of Justice, and the state of West Virginia, Consol was required to "design, construct, and operate a wastewater treatment plant, landfill, and pipeline collection system . . . for treatment of the Monongahela Basin Discharges." The application reviewed herein is for the construction and operation of this water treatment facility.

On February 13, 2012 a "no-permit needed" decision (PD12-003) was issued to Consol for the haulroad activities associated with the water treatment plant. Those haulroad emissions have been rolled into this permit application.

DESCRIPTION OF PROCESS

As noted above, as part of a consent decree, Consol was required to construct a wastewater

treatment facility to clean the mine-water discharges of the Loveridge, Blacksville Number 2, Robinson Run, and Four States mines (collectively, the Monongahela Basin Discharges). Pursuant to the consent order, it is required to treat an incoming flow of 3,500 gallons per minute using pretreatment, reverse osmosis, and evaporation and/or crystallization processes.

Potential sources of air emissions at the facility, as identified by the applicant, are limited to particulate matter emissions from pneumatic unloading of soda ash and hydrated lime into three silos (one soda ash and two lime), load-out of evaporated salts, combustion exhaust emissions from an emergency generator, and fugitive particulate matter from haulroad activity. Consol has identified no other potential sources of air emissions at the facility including no use of VOC-containing solvents or compounds that may be emitted. Consol provided a very detailed chemical analysis of the treatment process in the permit application that will not be reproduced here.

The proposed emergency generator will use an EPA Tier 2-certified Tognum America, Inc., AKA, MTU Onsite Energy Model R1238A39 (12V2000 G45-TB 3D)) diesel-fired 780 kW-output engine paired with Marathon Electric Model 574RSL4037 Generator. Consol has proposed a maximum annual operation limit of 500 hours.

The 150 ton elevated silos (1S, 2S, and 3S) used to store soda ash and hydrated lime will be loaded pneumatically by truck and controlled by individual baghouses/fabric filters on each silo. The salt load-out shall occur in a direct dump from a collection bin into a truck. While not controlled, the moisture content of the salt after dewatering has been estimated to be a worst-case (emission-wise) of 5% which will mitigate particulate matter emissions. Unpaved haulroads will be used to transport waste sludge, salts, and other materials from the facility to an associated landfill on-site. The haulroad will be controlled with a water truck.

SITE INSPECTION

On March 27, 2012 the author conducted a site inspection of the proposed Northern WV Water Treatment Plant. The contacts for the inspection were Mr. Chris Daniels of Alliance Consulting, Inc. and Mr. Jim Spratt, a contractor for Consol. The proposed site is located in an isolated valley approximately three miles to the northwest of Mannington, WV. Significant construction had been completed on the water tanks, pipe racks, and other facilities at the time of the inspection but the emergency generator was not on-site.

The proposed location of the source is in a relatively isolated area and there are no occupied residences visible from the site. The nearest occupied residence is estimated to be approximately one half mile to the north of the plant. The nearest community is Mannington which, as stated above, is approximately three miles to the southeast. The site is bounded on the east by Dent's Run Road (County Route 5) and to the west by hillsides. North and south of the facility is the natural contour of the valley. Any potential nuisance (odor, noise) from the proposed facility should be mitigated by this location.

Directions: From Mannington, travel west approximately 1.3 miles on Buffalo Street until reaching the intersection of Buffalo St. and Dents Run Road (County Route 5). Turn right onto Dents Run Road and proceed approximately 2.3 miles to the north. The facility is located on the left.

REVIEW OF APPLICANT'S EMISSIONS ESTIMATE

In the permit application, Consol supplied an emissions estimate for the potential emission sources at the proposed facility. The following will discuss the methodology of Consol's emissions estimate for each source.

Emergency Generator

Potential emissions from the Tognum America, Inc., AKA, MTU Onsite Energy Model R1238A39 (12V2000 G45-TB 3D)) diesel-fired 780 kW-output engine were based on emission factors provided by the engine manufacturer and given in AP-42, Section 3.3 (10/96). Hourly emissions were based on the worst-case operating mode (per-pollutant) as provided in the manufacturer's estimate and annual emission were based on an operation of 500 hours of operation per year. The following tables detail the potential emissions of the emergency generator.

Table 1: Emergency Generator Hourly Emissions at Various Power kW Levels (Output)

Pollutant	78		195		390		585		780	
	g/kWh	lb/hr	g/kWh	lb/hr	g/kWh	lb/hr	g/kWh	lb/hr	g/kWh	lb/hr
HC (VOCs)	1.42	*0.24*	0.54	0.23	0.23	0.20	0.13	0.17	0.06	0.11
NO_x	14.80	2.55	6.23	2.68	5.12	4.40	5.15	6.64	5.92	*10.18*
CO	4.04	0.69	1.44	0.62	0.69	0.59	0.47	0.60	0.47	*0.81*
PM	0.17	0.03	0.18	*0.08*	0.09	0.07	0.04	0.05	0.03	0.05
SO_2 (1)	1.24	0.21	1.24	0.53	1.24	1.07	1.24	1.60	1.24	*2.14*

(1) Based on AP-42 Section 3.3-1, Table 3.3-1 as converted to g/kWh.

Table 2: Emergency Generator Potential-to-Emit

Pollutant	lb/hr	tons/year(1)
NO_X	10.18	2.55
CO	0.81	0.20
VOC	0.24	0.06
PM(2)	0.08	0.02
SO_2	2.14	0.54

(1) Based on 500 hours operation/year.
(2) All PM emissions are assumed to be $PM_{2.5}$ or less.

Material Handling Emissions

Particulate matter emissions from material handling and haulroad emissions were based on the following AP-42 Sections:

Table 3: Sources of Emission Factors for Particulate Matter

Emission Source	Emission Factor(s)	Emission Factor Source	Comments
Soda Ash Unloading	5.2 lb-PM/ton-soda ash unloaded (no $PM_{2.5}$ or PM_{10} estimated)	AP-42 Section 12.3 (7/93)	Uncontrolled. Controlled emissions based on baghouse capture efficiency of 99.9%.
Hydrated Lime Unloading	0.72 lb-PM/ton-lime unloaded (no $PM_{2.5}$ or PM_{10} estimated)	AP-42 Section 11.2 (6/06)	Uncontrolled. Uses cement unloading as a surrogate. Controlled emissions based on baghouse capture efficiency of 99.9%.
Salt Load-out	0.003 lb-PM/ton-salt (no $PM_{2.5}$ or PM_{10} estimated)	AP-42, Section 13.2.4 (11/06)	Emission factor calculation salt moisture content (5%) and average wind speed (8.1 mph).
Unpaved Haulroads(1)	Various	AP-42 Section 13.2.2 (11/06)	Uncontrolled. Based on mean truck weights (various), percent silt in road surface (10%), and number of precipitation days (157). Controlled emissions based on 70% control from use of a water truck.

(1) The author recalculated unpaved haulroad emissions based on information provided in PD12-003 using the G10-D emission calculation spreadsheet.

Emissions from the material handling sources were calculated using the above emission factors and maximum hourly and annual throughputs. Where no $PM_{2.5}$ or PM_{10} emissions were estimated in the application, worst-case emissions of those pollutants shall be equal to the total particulate matter emissions.

Sulfuric Acid Storage Tank

Consol has proposed the use of a sulfuric acid storage tank. Based on the acid mist standards under §45-7-4.2, sulfuric acid is considered a "regulated pollutant." However, due to the very low vapor pressure of sulfuric acid, and the use of a device to recycle displaced air back into the storage tank when the tank is being loaded, no substantive emissions are expected from its use.

Facility Potential to Emit

Based on the above estimation methodology, which is determined to be appropriate, the annual PTE of the proposed Northern WV Water Treatment Plant is given in the following table:

Table 4: Facility-Wide Annual Potential-to-Emit (PTE) Summary in TPY

Source	CO	NO_x	$PM_{2.5}$	PM_{10}	PM	SO_2	VOCs
Emergency Generator	0.20	2.55	0.02	0.02	0.02	0.54	0.06
Material Handling	0.00	0.00	0.14	0.14	0.14	0.00	0.00
Haulroads	0.00	0.00	0.45	4.52	15.31	0.00	0.00
Facility-Wide Totals →	**0.20**	**2.55**	**0.61**	**4.68**	**15.47**	**0.54**	**0.06**

REGULATORY APPLICABILITY

This section will address the potential regulatory applicability/non-applicability of substantive state and federal air quality rules relevant to the proposed construction of Consol's Northern WV Water Treatment Plant.

45CSR2 and 45CSR10 (Emergency Generator non-applicability)

Pursuant to the definition of "fuel burning unit" under 45CSR2 and 45CSR10 ("producing heat or power by indirect heat transfer"), the sections of those rules applicable to "fuel burning units" do not apply to the emergency generator.

45CSR7: To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations

45CSR7 has three substantive requirements potentially applicable to the particulate matter-generating operations at the water treatment plant. These are the opacity requirements under Section 3, the mass emission standards under Section 4, and the fugitive emission standards under Section 5. Each of these sections will be discussed below. Based on previous determinations made by the DAQ, particulate matter emissions from the emergency generator are not subject to 45CSR7.

45CSR7 Opacity Standards - Section 3

Section 3.1 sets an opacity limit of 20% on the material handling operations. Use of the baghouses on the silos and the expected moisture content of the salt during load-out should mitigate any opacity problems from these sources.

45CSR7 Weight Emission Standards - Section 4 (non-applicability)

Section 4.1 of 45CSR7 requires that each manufacturing processes meet a particulate matter limit based on the weight of material processed through the source operation. However, pursuant to §45-7-10.5, a manufacturing process "shall be exempt from subsection 4.1 for source(s) of emissions that have a potential to emit less than one (1) pound per hour of particulate matter and an aggregate of less than one thousand (1,000) pounds per year for all such sources of particulate matter located at the stationary source. Each material handling source has a particulate matter emission rate of less than one pound per hour and an aggregate of less than 1,000 pounds per year. Therefore, the material handling sources are not subject to Section 4 of 45CSR7.

Section 4.2 of 45CSR7 requires that "[m]ineral acids shall not be released from any type source operation or duplicate source operation or from all air pollution control equipment installed on any type source operation or duplicate source operation in excess of the quantity given in Table 45-7B found at the end of this rule." As stated above, no substantive emissions of sulfuric acid are expected from the storage tank.

45CSR7 Fugitive Emissions - Section 5

Sections 5.1 and 5.2 of Rule 7 states that each manufacturing process or storage structure must

include a system to minimize the emissions of fugitive particulate matter. The potential fugitive particulate emissions from the facility are limited to the haulroads and plant mobile work areas (the silos are enclosed and each vented to a baghouse). The area immediately in and around the plant will be paved. The haulroads from the facility to the landfill will be unpaved but will be controlled with a water truck. These methods of control are determined to be sufficient to meet Section 5 of 45CSR7.

45CSR13: Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation

The proposed construction of the water treatment plant has a potential, without enforceable limitations, to emit a regulated pollutant in excess of six (6) lbs/hour and ten (10) TPY and, therefore, pursuant to §45-13-2.24, the installation is defined as a "stationary source" under 45CSR13. Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction . . . and operation of any stationary source to be commenced without . . . obtaining a permit to construct." Therefore, Consol was required to obtain a permit under 45CSR13 for the construction and operation of the water treatment plant.

As required under §45-13-8.3 ("Notice Level A"), Consol placed a Class I legal advertisement in a "newspaper of general circulation in the area where the source is . . . located." The ad ran on February 27, 2012 in *Times West Virginian* and the affidavit of publication for this legal advertisement was submitted on March 28, 2012.

45CSR17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter (non-applicability)

45CSR17 requires facilities to "prevent and control particulate matter air pollution from materials handling, preparation, storage and other sources of fugitive particulate matter." However, based on §45-17-6.1, sources that are subject to the fugitive particulate matter emission requirements of 45CSR7 are exempt from the provisions of this 45CSR17. The potential sources of fugitive particulate matter at the proposed facility are subject to the requirements of 45CSR7 and are, therefore, exempt from 45CSR17.

45CSR30: Requirements for Operating Permits

45CSR30 provides for the establishment of a comprehensive air quality permitting system consistent with the requirements of Title V of the Clean Air Act. The proposed facility does not meet the definition of a "major source under § 112 of the Clean Air Act" as outlined under §45-30-2.26 and clarified (fugitive policy) under 45CSR30b. However, as the preparation plant is subject to a New Source Performance Standard (NSPS) - 40 CFR 60, Subpart IIII - the facility would, in most cases, be subject to Title V as a "deferred source." However, pursuant to §60.4200©, as a non-major source, Consol is not required to obtain a Title V permit for the proposed facility. Therefore, the Northern WV Water Treatment Plant is not subject to 45CSR30 .

40 CFR 60 Subpart IIII: Standards of Performance for Stationary Compression Ignition Internal

Combustion Engines.

Section §60.4200 states that "provisions of [Subpart IIII] are applicable to manufacturers, owners, and operators of stationary compression ignition (CI) internal combustion engines (ICE)." Specifically, it states that "stationary CI ICE with a displacement of less than 30 liters per cylinder where the model year is . . . 2007 or later, for engines that are not fire pump engines" are subject to the standards under Subpart IIII. Consol has proposed the installation of a Model Year 2012/2013 emergency CI ICE with a displacement of less than 30 liters/cylinder that is, therefore, subject to Subpart IIII.

Standards for owner/operators of emergency CI ICE are given under §60.4205. Specifically, for the proposed Consol engine: "Owners and operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines must comply with the emission standards for new nonroad CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE."

Section §60.4202 sets the emission standards for CI ICE manufacturers. Specifically, for the engine in question, it states (under §60.4202(a)(1)) that manufacturers must certify their 2007 model year and later emergency stationary CI ICE with a maximum engine power greater than or equal to 37 KW (50 HP) but less than 2,237 KW (3,000 HP), and a displacement of less than 10 liters per cylinder, to the emission standards for new non-road CI engines for the same model year and maximum engine power in 40 CFR 89.112 and 40 CFR 89.113 for all pollutants. Compliance with the standards under 40 CFR 89.112 and 40 CFR 89.113 is certified by EPA for specific engines or families of engines. As some engines are compliant based on family averages, specific standards are not available.

Therefore, compliance with Subpart IIII is demonstrated by certification of the engine by EPA. Information was provided by Consol that the Tognum America family of engines (CMDDL35.8GRR) is certified by EPA as compliant with the above standards.

40 CFR 63 Subpart ZZZZ: National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

The proposed emergency generator appears to be subject to the area source requirements of 40 CFR 63, Subpart ZZZZ. However, the DAQ has not been delegated authority from USEPA to enforce the area source requirements of this rule. However, it is important to note, for the proposed engine in question, compliance with 40 CFR 60, Subpart IIII would ensure compliance with 40 CFR 63 Subpart ZZZZ.

TOXICITY ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides an analysis for those regulated pollutants that may be emitted from the proposed selenium treatment plant and that are not classified as "criteria pollutants." Criteria

pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NO_x), Ozone, Particulate Matter (PM), Particulate Matter less than 10 microns (PM_{10}), Particulate Matter less than 2.5 microns ($PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect the public health and welfare. Other pollutants of concern, although designated as non-criteria and without national concentration standards, are regulated through various federal and programs designed to limit their emissions and public exposure. These programs include federal source-specific Hazardous Air Pollutants (HAPs) limits promulgated under 40 CFR 61 (NESHAPS) and 40 CFR 63 (MACT). Any potential applicability to these programs were discussed above under REGULATORY APPLICABILITY.

HAPs

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows or suspects may cause cancer or other serious human health effects. Due to the annual hour of operation limit on the emergency generator, the proposed facility has the potential to emit only trace amounts of HAPs.

Sulfuric Acid

Consol has proposed the use of sulfuric acid in the water treatment process including the use of a 9,105 gallon storage tank. Based on the acid mist standards under §45-7-4.2, sulfuric acid is considered a "regulated pollutant." However, based on the very low vapor pressure of sulfuric acid, and the use of a device to recycle displaced air back into the storage tank when the tank is being loaded, no substantive emissions are expected from its use. Proposed requirements for the use of sulfuric acid are given under 4.1.9. of the draft permit. A toxicity analysis of sulfuric acid is not provided on the Integrated Risk Information System (IRIS).

AIR QUALITY IMPACT ANALYSIS

The proposed construction does not meet the definition of a "major stationary source" pursuant to 45CSR14 and, therefore, an air quality impact (computer modeling) analysis was not required.

MONITORING, COMPLIANCE DEMONSTRATIONS, RECORD-KEEPING, AND REPORTING REQUIREMENTS

The following substantive monitoring, compliance demonstration, and record-keeping requirements shall be required:

- For the purposes of demonstrating compliance with the maximum generator usage limit set forth in 4.1.3. of the draft permit, Consol shall be required to monitor and record the monthly and rolling twelve month records of the amount of hours the emergency generator is in use.

- For the purposes of demonstrating continuous compliance with maximum throughput limitations set forth in Table 4.1.4 and 4.1.9(c) of the draft permit, Consol shall be required to monitor and record the monthly and rolling twelve month throughput of each material

specified under Table 4.1.4 and 4.1.9(c).

- In order to determine compliance with 45CSR7 opacity requirements, the permittee shall conduct visible emission checks and/or opacity monitoring and recordkeeping for all emission sources subject to an opacity limit pursuant to the requirements of 4.2.3(a), (b), and (c).

- Consol is required to comply with all applicable monitoring, compliance demonstration, and record-keeping requirements as given under 45CSR7 and 40 CFR 60, Subpart IIII, Sections §60.4209 and §60.4211.

Note that under Requirement 3.2 of the Draft Permit, compliance with all annual limits shall be based on a rolling twelve month total.

PERFORMANCE TESTING OF OPERATIONS

The following substantive performance testing requirements shall be required:

- Consol shall be required to, when required by the Director, conduct or have conducted test(s) to determine compliance with the emission limitations or emission control requirements established in the draft permit and/or applicable regulations.

- Consol shall be required to comply with all applicable performance testing requirements as given under 45CSR7 and 40 CFR 60, Subpart IIII, Section §60.4212.

RECOMMENDATION TO DIRECTOR

The information provided in the permit application indicates that compliance with all applicable regulations will be achieved. Therefore, I recommend to the Director the issuance of a Permit Number R13-2921 to Consol Energy, Inc. for the above discussed construction of a Northern West Virginia Water Treatment Plant proposed near Mannington, Marion County, WV.

_____
Joe Kessler, PE
Engineer

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Date